BUILT-IN (BI) SERIES CONDENSED ELECTRONIC CONTROL INFORMATION BOOKLET

NOTE: *If more detailed information on the electronic control is needed, referenced the complete Service Manual.*

Part #7013338 - Rev. A - March, 2009

TABLE OF CONTENTS

PAGE

Table of Contents 2
Basic Input Operations 3
Unit ON/OFF - Adjust Set-Points - IM ON/OFF - Max Ice ON/OFF - Door Alarm ON/OFF - Air Purification ON/OFF - Accent Lighting ON/OFF
Unique Input Operations 4
Temp Units Selection Mode - Contrast Adjust Mode - Tone Adjust Mode - Showroom Mode - Sabbath Mode - Zone Disable Mode - Manual Defrost
Instruction and Fault Indicators 6
Service Input Operations 8
Diagnostic Mode 8
Fault Code Recall Mode 10
Temperature Log Recall Mode 13
Model Configuration Mode 14
Manual Component Activation 16
Self-Test Mode 18

BUILT-IN SERIES

Basic Input Operations

- **Unit ON/OFF**
  - Press POWER key.
- **Adjusting Set-Point** *(Temperature Adjust)*
  - Press COLDER or WARMER key of desired compartment
    NOTE: *Actual temperature is displayed 10 seconds after last keystroke.*
- **Icemaker System ON/OFF**
  - Press ICE key.
- **Maximum Ice Production Feature ON/OFF**
  - Press MAX ICE key.
    NOTE: *Automatically converts to normal operation after 24 hours.*
- **Door Ajar Alarm ON/OFF**
  - Press ALARM key.
- **Air Purification Feature ON/OFF**
  - Press PURE AIR key.
- **Accent Lighting System ON/OFF**
  - Press LIGHTS key.

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Unique Input Operations

- **Temperature Units Selection Mode** *(°F or °C Display)*
  - Within first minute of switching unit on, press ALARM key and POWER key simultaneously for 5 seconds.
    NOTE: *Mode will end 10 seconds after last keystroke.*
- **Contrast Adjust Mode** *(LCD Contrast Level)*
  1. Within first minute of switching unit on, press COLDER, WARMER and POWER keys simultaneously for 5 seconds. (“c” appears at small digit, with “1”, “2”, “3”, “4” or “5” at right)
  2. Press Colder or WARMER key to toggle
     NOTE: *Mode will end 10 seconds after last keystroke.*
- **Tone Adjust Mode** *(Audible Chime Tone)*
  1. Within first minute of switching unit on, press COLDER, WARMER and POWER keys simultaneously for 5 seconds
  2. Press POWER key.
     (“s” appears at small digit, with “HI” or “nO” or “Lo” at right)
  3. Press Colder or WARMER key to toggle.
     NOTE: *Mode will end 10 seconds after last keystroke.*

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- **Showroom Mode** *(Disables all cooling functions)*
  1. Switch unit off with POWER key.
  2. Press COLDER, WARMER & POWER keys simultaneously

  NOTE: *To return to normal operation, repeat steps above.*
- **Sabbath Mode** *(Disables all but cooling functions)*
  1. Switch unit off with POWER key.
  2. Press POWER key for 10 seconds.

  NOTE: *To exit Sabbath Mode, press POWER key.*
- **Zone Disable Mode** *(Disables cooling functions in 1 zone)*
  1. Switch unit off with POWER key.
  2. Press desired WARMER & POWER keys simultaneously

  NOTE: *To return to normal operation, repeat steps above.*
- **Manual Defrost**

  - Press & hold ICE key for 5 seconds.

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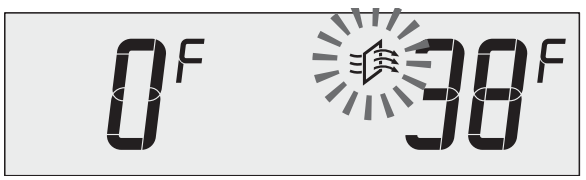
Possible Instruction & Fault Indicators

***NOTE**: Temperatures shown are for reference only, actual temperatures may vary.*

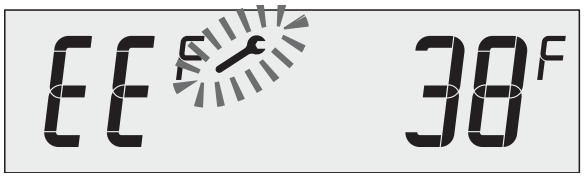


Replace Air Filter

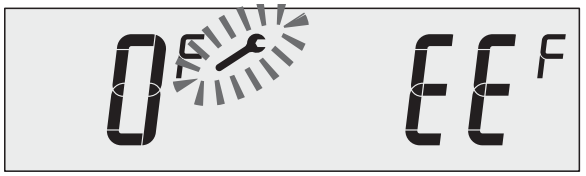
***NOTE:** Press PURE AIR Key for 5 seconds to reset timer.*

Replace Water Filter

***NOTE:** Press filter reset button for 5 seconds to reset counters.*

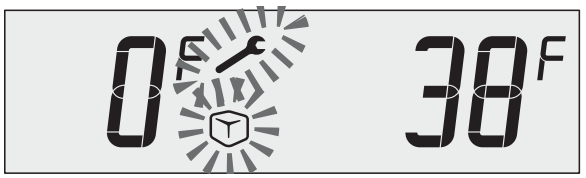


Freezer Compartment Thermistor Fault

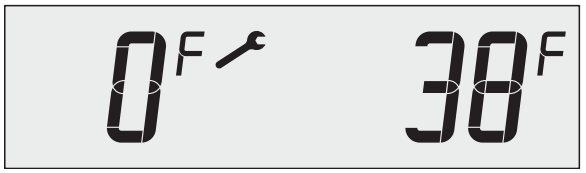


Refrigerator Compartment Thermistor Fault

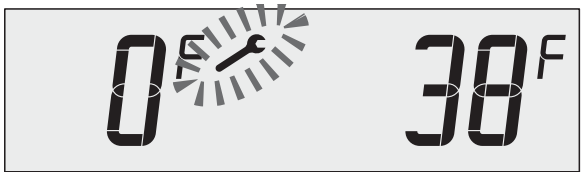
BUILT-IN SERIES



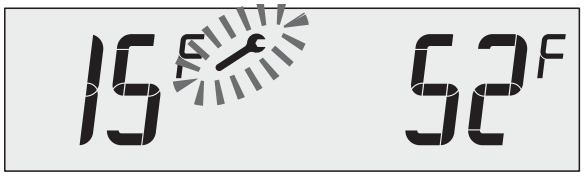
Icemaker System Problem; Icemaker System Disabled



Minor Fault Code Logged



Major Fault Code Logged



(Flashing w/Alarm Beeping)
Major Fault Code Logged Needing Immediate Attention

NOTES:

> *All Fault Codes will reappear after repairs unless ALARM key is pressed for 15 seconds.*

> *To suspend a Fault Code for 24 hours, press and hold ALARM then POWER keys simultaneously for less than 5 seconds.*

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Service Input Operations

- **Diagnostic Mode** *(Observe Current Thermistor Temperatures)*
  NOTE: *Keystrokes for Diagnostic Mode and Fault Code Recall Mode are the same.*
  1. Press COLDER and POWER simultaneously, then release. If no Fault codes observed, temperature appears at left with location code at right.
  2. Press Colder or WARMER key to toggle.

THERMISTOR LOCATION CODE TABLE	
CODE	**LOCATION**
r	**Refrigerator Compartment**
rE	**Refrigerator Evaporator**
F	**Freezer Compartment**
FE	**Freezer Evaporator**
dr	**Refrigerator Drawers (Not Active)**
Cn	**Condenser (Not Active)**
A	**Ambient**

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DIAGNOSTIC MODE NOTES:

> *Mode will end 20 seconds after last keystroke.*
> *Pressing and holding COLDER and POWER keys for 10 seconds will initiate Manual Zone Disable Mode.*
> *If “Sh” and “r” appear when initiating Diagnostic Mode, unit is in Showroom Mode.*
> *If “EE” appears when in Diagnostic Mode, thermistor in that location is defective.*
> *There is no thermistor in the drawers, so “EE” will appear at left of the “dr”.*
> *There is no thermistors on the condenser, so “EE” will appear at left of the “Cn”.*
> *The ambient thermistor is part of the control board. It is not a separate component.*

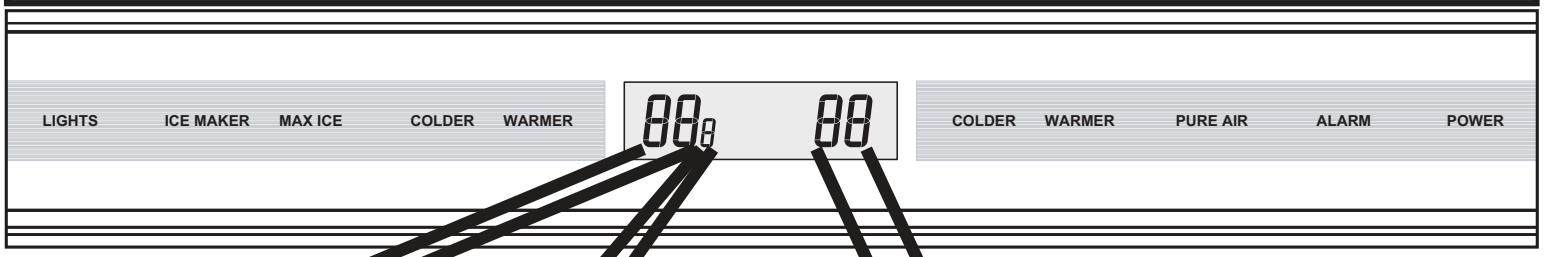
BUILT-IN SERIES

Service Input Operations

- **Fault Code Recall Mode** *(Observe Stored Fault Codes)*
  NOTE: *Keystrokes for Fault Code Recall Mode and Diagnostic Mode are the same.*
  1. Press COLDER and POWER simultaneously, then release.
  2. Press Colder or WARMER key to toggle.

     NOTES:
     - > *Mode will end 10 seconds after last keystroke.*
     - > *Pressing and holding COLDER and POWER keys for 10 seconds will initiate Manual Zone Disable Mode.*
     - > *If "Sh" and "r" appear when initiating Fault Code Recall Mode, unit is in Showroom Mode.*
     - > *To clear fault codes, press ALARM key for 15 seconds.*
     - > *If Fault Codes are present but the desire is to view current temperature readings from thermistors (Diagnostic Mode), then press ALARM key; this will shift electronic control system into Diagnostic Mode.*

FAULT CODE TABLE WITH LCD CORRELATION DIAGRAM (PAGE 1 of 2)



10	Thermistor Faults
15	Relay Faults
20	Defrost Heater Faults
30	Ice/Water/Accessory Faults
35	Fan Faults
40	Runtime Faults
44	Glass Heater Faults
45	Lighting Faults
50	Flow Meter
60	Load/Component Faults
90	Control Faults
95	Diagnostics
98	Power Faults

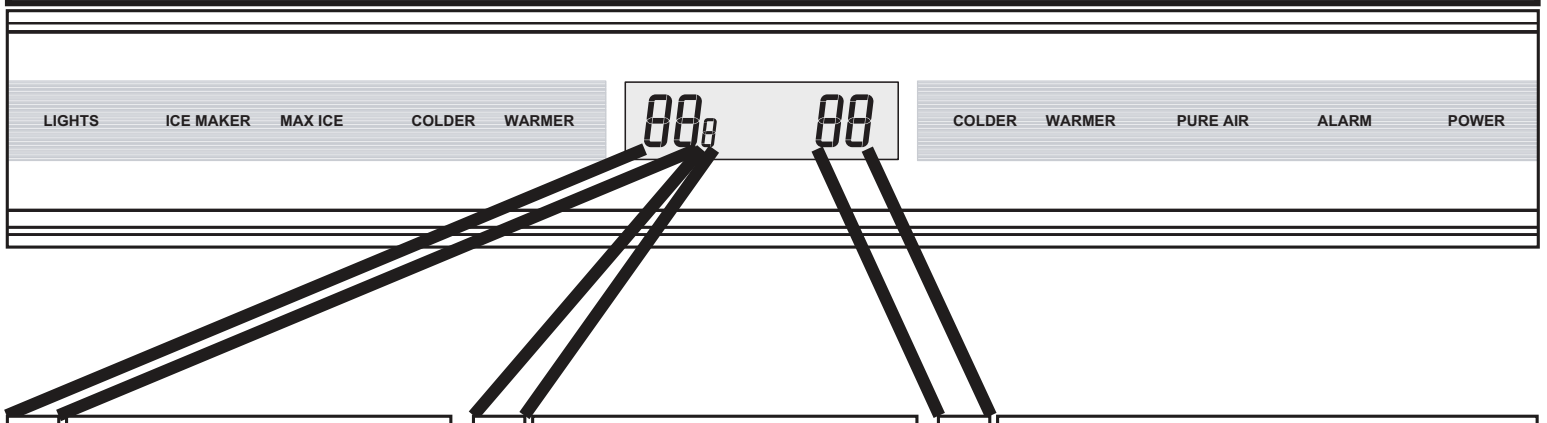
0	Misc
1	Refrigerator
2	Freezer
3	Condenser
4	Defrost System
5	Control System
6	Compressors
7	Ambient
8	Icemaker
9	Dispenser
A	Air Purifier
d	TC Drawer
F	Freezer Evaporator
H	High Voltage System
L	Lighting
r	Refrigerator Evaporator
U	Water Systems

00	Open
01	Short/Closed
02	Unstable
05	Miswire normal temps
06	Miswire overheat
07	Bad Ohms
09	Too Warm/Large Temp Differential
10	Second Device Open
11	Second Device Short/Closed
12	Second Device Unstable
20	Third Device Open
21	Third Device Short/Closed
22	Third Device Unstable
25	Diagnostics Failure
30	Valve Enabled Too Long
33	Speed Setting too Low
34	Speed Setting too High
35	Fan speed error
36	Fan current too low
37	Fan current too high
38	Fan Power Output Fault
39	DC Fan Output Fault
40	Excessive runtime
42	Primary Heater Fault
43	Secondary Heater Fault
44	Door Heater Output Fault
45	Burned out Light
46	No Position/State Detect

NOTE: These Columns are repeated on next page

NOTE: This Column is <u>continued</u> on next page

FAULT CODE TABLE WITH LCD CORRELATION DIAGRAM (PAGE 2 of 2)



10	Thermistor Faults
15	Relay Faults
20	Defrost Heater Faults
30	Ice/Water/Accessory Faults
35	Fan Faults
40	Runtime Faults
44	Glass Heater Faults
45	Lighting Faults
50	Flow Meter
60	Load/Component Faults
90	Control Faults
95	Diagnostics
98	Power Faults

0	Misc
1	Refrigerator
2	Freezer
3	Condenser
4	Defrost System
5	Control System
6	Compressors
7	Ambient
8	Icemaker
9	Dispenser
A	Air Purifier
d	TC Drawer
F	Freezer Evaporator
H	High Voltage System
L	Lighting
r	Refrigerator Evaporator
U	Water Systems

NOTE: These Columns are repeated from last page

50	Open Heater
55	Triac Open
56	Triac Short
60	No Load/Load Open
65	Stuck at Dispenser Water Valve Out
66	Stuck at Ice Water Valve Out
70	Bad Flash Write
71	Flash Initialized
72	Flash Memory Bad
73	Invalid Log Fault Checksum
74	Invalid E2 Checksum
75	Invalid Model E2 Checksum
80	No Communication
81	Communications Time-out
82	Partial Communications
83	Bad Micro Communication
84	Micro Initialization
85	Display Failure
86	Too Slow
87	No Flow
90	Framing Errors
92	Excessive Collisions
93	Data Overrun
95	FMEA Error
96	Calibration or Low Signal Error
97	Quantum SPI
98	Brownout
99	Other

NOTE: This Column is <u>continued</u> from last page

Service Input Operations

- **Temperature Log Recall Mode** *(Observe Average Temp Data)*
  1. Initiate Diagnostic Mode by pressing COLDER and POWER simultaneously, then release. If fault codes are observed, press ALARM key.
  2. Press COLDER or WARMER key to toggle to desired thermistor.
  3. Press and hold POWER key, then WARMER key, then release.
     a. Temperature appears at left; index at right.
     b. Location code will flash at 3 second intervals.

     NOTES:
     - > *Mode ends 20 seconds after the last key stroke.*
     - > *"bL" at left = blank, no temperature data.*
     - > *Service icon = POWER key pressed during that index.*
     - > *Alarm bell icon = power failure during that index.*
     - > *If Manual Compartment Disable Mode was activated, average temperatures will be logged, but no event indicator.*
     - > *If unit was in Showroom Mode, average temperatures will be logged, but no event indicator.*
     - > *If the unit was switched OFF, average temperatures will be logged and service indicator would be present.*

BUILT-IN SERIES

Service Input Operations

- **Model Configuration Mode** *(Apply Appropriate Model Batch Files to E-Control)*
  1. Initiate Diagnostic Mode by pressing COLDER and POWER simultaneously, then release. If fault codes are observed, press ALARM key.
  2. Press and hold POWER key for 10 seconds.
  3. Press COLDER or WARMER key to toggle through model codes; stop when appropriate code is displayed.
  4. Press POWER key, “Pr g” appears.
  5. Press POWER key again within 5 seconds.

     NOTES:

     > *Second press of POWER key must occur w/in 5 seconds.*
     > *With no keys pressed, mode automatically ends 30 seconds after last key stroke.*
     > *If the ALARM key is pressed, or if WARMER and COLDER keys are pressed during Model Configuration Mode, mode is exited.*
     > *Model code sequence is as shown in tables on next page.*

BUILT-IN SERIES

MODEL CODE SEQUENCE TABLE

36 U	42 S	36 UI	42 SI
48 SD	42 SD	48 SDI	42 SDI
48 S	36 S	48 SI	36 SI
36 R	36 UG	36 RI	36 UGI
36 F	36 RG	36 FI	36 RGI
30 U	30 UG	30 UI	30 UGI

NOTE: *The main control board is used in domestic and international units. An "I" at end of the model code indicates an International model code. Currently only 4 digits can be displayed, so if code is 5 digits long (Ex: 30UGI, 36UGI, 36RGI, 42SDI & 48SDI), 5th digit will not appear. Until this is addressed, stopping when appropriate model code is first observed (domestic only) should result in proper operation.*

BUILT-IN SERIES

Service Input Operations

- **Manual Component Activation Mode** *(Individual Component Activation)*
  1. Initiate Diagnostic Mode by pressing COLDER and POWER simultaneously, then release. If fault codes are observed, press ALARM key.
  2. Press and hold desired zone's COLDER key for 10 seconds. (Chosen zone's components can forced to ON for five (5) minutes, or OFF using WARMER or COLDER keys)
  3. Press WARMER key to activate next component; press COLDER key to activate previous component.

     NOTES:

     > *All temperatures displayed are current, without weighted averaging or offsets.*

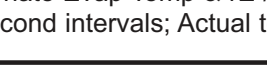
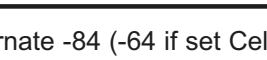
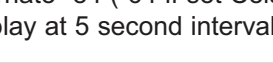
     > *With no keys pressed, mode automatically ends 5 minutes after last key stroke.*

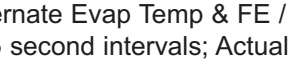
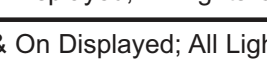
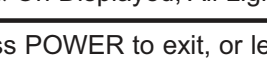
     > *Pressing any key (other than POWER or ALARM) during this mode restarts the 5 minute timer.*

     > *Pressing ALARM key during this mode will end the mode.*

     > *Pressing POWER key during this mode will force control into Diagnostic Mode.*

     > *"-84^{F}" or "-64^{C}" will appear in place of temperature if thermistor is open or missing.*

REFRIGERATOR ZONE MANUAL COMPONENT ACTIVATION TABLE			
STEP	**FUNCTIONS / COMPONENT(S)**	**LCD VIEW**	**COMMENTS**
1	All Components OFF; All Lights OFF		OFF Displayed; All Lights OFF
2	Ref Compressor ON		Zone Temp & r Displayed; Actual temps will vary
3	Ref Evaporator Fan ON (Comp stays ON)	 	Alternate Evap Temp & rE / Zone Temp & rC Display at 5 second intervals; Actual temps will vary
4	Condenser Fan ON (Comp/Evap fan stays ON)		Zone Temp & Cd Displayed; Actual temps will vary
5	Drawer Fan(s) ON (Comp/Evap/Cond fan switch OFF)	 	Alternate -84 (-64 if set Celsius) & dr / Evap Temp & rE Display at 5 second intervals; Actual temps will vary
6	Drawer Fan(s) OFF		OFF Displayed; All Lights ON
7	Air Purifier Light & Fan ON		Ar & Ft Displayed
8	Everything OFF (Light relay ON/Lights OFF)		OFF Displayed; All Lights OFF
9	Main Lights ON		LS & On Displayed; Main Lights ON; All else OFF
10	Accent/Display Lights ON		AC & Lt Displayed; All Lights ON
EXIT	Normal ON Mode		Press POWER to exit, or let time out

FREEZER ZONE MANUAL COMPONENT ACTIVATION TABLE			
STEP	**FUNCTIONS / COMPONENT(S)**	**LCD VIEW**	**COMMENTS**
1	All Components OFF; All Lights OFF		OFF Displayed; All Lights OFF
2	Fre Compressor ON		Zone Temp & F Displayed; Actual temps will vary
3	Fre Evap Fan ON (Comp stays ON)	 	Alternate Evap Temp & FE / Zone Temp & FC Display at 5 second intervals; Actual temps will vary
4	Condenser Fan ON (Comp/Evap fan stays ON)		Zone Temp & Cd Displayed; Actual temps will vary
5	Defrost Heater ON		Evap Temp & Et Displayed; Actual temps will vary
6	Defrost Heater ON; Evap Fan ON		Evap Temp & dE Displayed; Actual temps will vary
7	All Components OFF; All Lights OFF		OFF Displayed; All Lights OFF
8	All Lights ON		LS & On Displayed; All Lights ON
EXIT	Normal ON Mode		Press POWER to exit, or let time out

Service Input Operations

- **Self-Test Mode** *(Forced E-Control Cycling)*
  1. Initiate Diagnostic Mode by pressing COLDER and POWER simultaneously, then release. If fault codes are observed, press ALARM key.
  2. Press and hold COLDER, WARMER and POWER key, then release.

     NOTES:

     > *Self-test lasts approximately 5 seconds.*

     > *After running* Self Test Mode, Fault Code Recall Mode must be initiated to view any fault codes that may have been logged during the self test.